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Microscopic model of dielectric α-relaxation in disordered media

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Abstract

The micro/mesoscopic theory of dielectric relaxation has been developed. Based on the fractional kinetics it gives a possibility to obtain the desired expression for the complex dielectric permittivity (CDP) and describe the asymmetric peaks that are created presumably by the so-called "excess wing" located in high-frequency region. The well-known empirical Cole-Davidson expression and its generalization for the CDP were obtained from this theory. This theory is based on self-similar phenomenon and multi-channel organization of relaxation process in disordered dielectrics. The relaxation parameters are connected with the structural parameters of the medium considered. © 2013 Versita Warsaw and Springer-Verlag Wien.

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Keywords

Cole-Cole expression, Cole-Davidson expression, dielectric permittivity, excess wing, fractal kinetics, fractals